

**SUBMISSION INSTRUCTION NO. 3**  
**DESIGN PLANS AND REPORT FOR**  
**WASTE TO ENERGY, THERMAL TREATMENT, AND INCINERATION FACILITIES**

Developed by:

**Virginia Department of Environmental Quality**  
**Office of Waste Permitting and Compliance**  
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**I. DESIGN PLANS** [§480.A., 9 VAC 20-81-10] Submit the following design plans on 11” x 17” paper in the order provided as Part B Attachment III. A full-size set of Design Plans should also be provided in rolls and/or in pockets for review. The Design Plans shall be prepared and certified by a professional engineer registered to practice in the Commonwealth.

The following site features shall be included on each of the plan sheets as applicable:

- Existing site conditions, unless the information leads to confusion with the data intended for display;
- A survey grid with base lines and bench marks to be used for field control;
- All drainage patterns and surface water drainage control structures;
- Access roads and traffic flow patterns;
- All temporary and permanent fencing;
- Methods of screening such as berms, vegetation, or special fencing;
- Wastewater or leachate collection, control, storage, and treatment systems;
- Special waste handling areas;
- Construction notes and references to details; and
- Other site features.

- A. ***Title Sheet*** Provide a Title Sheet stating the project title, preparer of the plans, the person/organization for whom the plans were prepared, a table of contents, and a location map showing the location of the site and area to be served.
- B. ***Existing Site Conditions Plan Sheet*** [§480.A.1., 9VAC20-81-10] Show conditions existing at the site prior to facility development.
- C. ***Engineering Modification Plan Sheet*** [§480.A.2., 9 VAC 20-81-10] *{Applicable only to sites with engineering modifications}* Show engineering modifications indicating the appearance of the site after installation of all engineering modifications.
- D. ***Phasing Plan Sheets*** [§480.A.3., 9 VAC 20-81-10] Provide a series of plan sheets showing the progression of site development through time; a separate plan shall be provided for initial site preparations and for each major phase or new area where substantial site preparation must be performed. Each plan shall include a list of construction items and quantities necessary to prepare the phase/cell indicated.
- E. ***Design Drawing Plan Sheet(s)*** [§480.A.4. and B.1.b., 9 VAC 20-81-10] Show design information relating to the specific solid waste management process to include:
1. Profile and plan views of all structures and enclosures showing dimensions. The plan views shall show building setbacks, side and rear distances between the proposed structure and other existing or proposed structures, roadways, parking areas, and site boundaries.
  2. Interior floor plans, showing the layout, profile view, and dimensions of the processing lines, interior unloading, sorting, storage, and loading areas as well as other functional process areas. The plan should identify the storage area locations during normal operations and when facility downtime exceeds 24 hours.

3. A utility plan identifying the location and describing the stormwater drainage system, sanitary sewer system, water supply system, energy system, and interface of the proposed facility with the existing utility systems.

- F. ***Detail Drawing Plan Sheet(s)*** [§480.A.6., 9 VAC 20-81-10] Show detail drawings and typical sections for drainage control structures, access roads, fencing, buildings, signs, and other construction details.

**II. DESIGN REPORT** [§480.B., 9 VAC 20-81-10] The Design Report should include supplemental discussions and design calculations to facilitate department review of the proposed facility design. The Design Report shall be provided as Part B Attachment VI.

**Format** The format used for the Design Report should encourage clear analysis and presentation of the proposed waste to energy/thermal treatment/incineration facility design. The Design Report should start with a title page and table of contents followed by the following sections and discussions. The title page should identify the facility name and permit number, the permit applicant, document date, and document preparer information. In addition, the header or footer of each page should include the facility name, permit number, document title, revision date, and page number.

- A. ***Introduction*** [§480.B.1.a., 9 VAC 20-81-10] Provide an introduction that identifies the project title; engineering consultants; site owner, licensee, and operator; facility type and expected site life. Identify any exemptions or variances desired by the applicant.
- B. ***Site Access***
1. ***Security*** [§330. E.10., 9 VAC 20-81-10] Provide a discussion on the perimeter fencing types and gate controls to be employed to prevent unauthorized access.
  2. ***Roads*** [§330. E.2. and 480.B.1.d., 9 VAC 20-81-10] Indicate access roads to the gate and from the gate to the management areas. Show traffic flow patterns to and within the storage, transfer, and treatment areas. Specify the on-site access road material.
  3. ***Queuing*** [§330. E.8. and 480.B.1.d., 9 VAC 20-81-10] Indicate on-site parking, access and exit points, and describe the mechanisms or features which will be employed to provide for an even flow of traffic into, out of, and within the site. The description shall show that the waiting delivery vehicles will not back up onto the public road.
  4. ***Vehicle Maintenance*** [§480.B.1.d., 9 VAC 20-80-10] Describe and give detailed specification of the proposed on-site and off-site transportation system to service vehicles hauling wastes and residues.
- C. ***Facility Design*** Provide information on the following topics, referencing the Design Plans as appropriate.

1. **Site Activities** [§330.E.11. and 480.B.1.b., 9 VAC 20-81-10] Provide a description of the activities to be conducted on site with regards to the unloading, sorting, and treating of incoming solid wastes. Reference the appropriate Design Drawing Plan Sheet(s).
2. **Surface of Processing Areas** [§330.E.3. and E.5., 9 VAC 20-81-10] Provide a description of the surfaces of loading, unloading, and storage areas, demonstrating that they will withstand heavy vehicle usage and that they can be easily cleaned.
3. **Safety** [§330.E.4., 9 VAC 20-81-10] Discuss the use of truck wheel curbs and other safety features to prevent backing or falling into unloading pit.
4. **Fire System** [§330.E.1. and E.9, 9 VAC 20-81-10] Describe the fire alarm and protection systems to detect, control, and extinguish fires.
5. **Design Features** [§330.E.1. and E.7., 9 VAC 20-80-10] Describe how the facility design will prevent the migration of vectors, odors, dust, and litter off-site.

**D. Material Processing**

1. **Allowable Materials** [§480.B.1.a., 9 VAC 20-81-10] Reiterate materials proposed for acceptance and processing as indicated on DEQ Form PTB. Reference any information provided in PTB Attachment VIII on special waste acceptance and handling procedures.
2. **Service Area** [§480.B.1.a., 9 VAC 20-81-10] Specify the municipalities, industries, and collection and transportation agencies served
3. **Process Capacity** [§330.E.6., 330.E.11., 480.B.1.b. and 480.B.1.c.(1), 9 VAC 20-81-10] Provide the following information, referencing the Design Plans as applicable.
  - The process rate of the facility, in both tons per day and tons per hour;
  - The expected short term and projected future long term daily loading;
  - The location and the capacity of normal loading, unloading and storage areas<sup>1</sup>, in cubic yards and tons; include description of the time such areas can be practically used, based on expected short-term daily loadings;
  - The location and the capacity of emergency loading, unloading, storage areas and other disposal capabilities to be used when the facility system down-time exceeds 24 hours;
  - The designation of alternate management facilities or discussion of plans for transfer of stored waste in the event facility down-time exceeds 72 hours; and
  - The expected daily quantities of waste residues including, but not limited to, ashes,

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<sup>1</sup> Storage areas should address areas for storage of unprocessed incoming solid waste, process waste residues and effluents, and recovered materials, as applicable. The design shall allow for a minimum of 3-days of storage at maximum anticipated loading rates.

by-pass and recycled materials, air pollution control residues, and unauthorized wastes.

4. **Use, Reuse, and Reclamation** [§330.E.11.g. and 480.B.1.c.(3), 9 VAC 20-80-10] Describe any materials use, reuse, or reclamation activities to be operated in conjunction with the proposed facility.
5. **Disposal of Residues** [§330.E.11.f. and 480.B.1.c.(2), 9 VAC 20-80-10] Describe the proposed ultimate disposal location(s) for all facility-generated waste residues (including, but not limited to, ashes, by-pass and recycled materials, air pollution control residues, and unauthorized wastes).

E. ***Liquids Management***

1. **Stormwater** [§480.A.5.c., 9 VAC 20-80-10] Provide a description of all drainage patterns and surface drainage control structures within the waste and residue handling areas and at the site perimeter to include berms, ditches, sedimentation basins, pumps, sumps, culverts, pipes, inlets, velocity breaks, sodding, erosion matting, or other methods of erosion control. Reference the Design Plans as appropriate. If applicable, discuss the permits issued for stormwater management and discharge.
2. **Process and Storage Area Drainage** [§330.E.3., 9 VAC 20-80-10] Discuss the use and location of floor drains in the loading, unloading and storage areas and describe how the design will accommodate washdown operations. Include connections to the wastewater collection system. In cases of subgrade storage structures, show and describe how groundwater intrusion will be prevented.
3. **Wastewater** [§330.E.11.f., 480.A.5.g., and 480.B.1.c., 9 VAC 20-80-10] Discuss the wastewater collection, control and treatment (if applicable) systems to include pipes, manholes, trenches, berms, collection sumps or basins, pumps, and risers. Reference the Design Plans as appropriate. Indicate the final disposal location of all wastewaters.

F. ***Appendices*** [§480.B.1.e., 9 VAC 20-81-10] Provide the following appendices, if applicable.

1. **Calculations**. Provide Calculations substantiating the proposed process rate and storage capacity provided on DEQ Form PTB and discussed in this Design Report.
  - a. Process Rate
  - b. Storage Capacity
  - c. Table relating process rate to equipment and personnel needs

2. **Material Specifications**
3. **Operating Agreements**
4. **Wastewater Treatment Agreement(s)**
5. **Copies of DEQ issued Permits (Air, VPDES, etc.)**

### **III. CONSTRUCTION QUALITY ASSURANCE & TECHNICAL SPECIFICATIONS**

[§480.B. 9 VAC 20-81-10] This section discusses the Construction Quality Assurance Plan and Technical Specifications to be submitted with the Part B Application or Part B Modification Application as Attachment VII to DEQ Form SW PTB. This section applies to applicants proposing to construct and operate any of the solid waste management facilities discussed above.

- A. **Construction Quality Assurance Plan** [§480.B., 9 VAC 20-81-10] The Construction Quality Assurance (CQA) Plan is designed to ascertain that the constructed facility meets the requirements described in the plans and specifications. Provide specific instructions regarding all aspects of site construction for the type of solid waste management facility proposed. Provide references as appropriate to the Design Plans and Technical Specifications.
- B. **Technical Specifications** [§480.B.2.a.(2), 9 VAC 20-81-10] Provide technical specifications for the following site features:
  - Access Roads and Entrance
  - Screening
  - Fencing; and
  - Other Special Design Features. Examples include utilities for stormwater and wastewater conveyance and treatment, and surfaces for unloading, receiving, treatment, and storage areas.